UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

GENOA COLOR TECHNOLOGIES, LTD., Plaintiff, v. MITSUBISHI ELECTRIC CORP.; MITSUBISHI ELECTRIC US HOLDINGS, INC.; MITSUBISHI ELECTRIC AND ELECTRONICS USA, INC.; MITSUBISHI DIGITAL ELECTRONICS AMERICA, INC.; SAMSUNG ELECTRONICS CO., LTD.; SAMSUNG ELECTRONICS AMERICA, INC., Defendants.	Civil Action No. 07-CIV-6233 (PKC) (JHP)

DECLARATION OF JAMES F. SHANLEY, PH.D., IN SUPPORT OF DEFENDANTS' JOINT CLAIM CONSTRUCTION BRIEF

I, James F. Shanley, hereby declare as follows:

I. INTRODUCTION

1. I have been retained by counsel for Defendants in the above-captioned action. I make this declaration in support of Defendants' Joint Claim Construction Brief.

2. I have been asked to provide my opinion as to how a person of "ordinary skill in the art" would understand certain words or phrases in the claims of U.S. Patent No. 7,113,152 ("'152 patent"), entitled *Device, System and Method for Electronic True Color Display*. The opinions outlined below are entirely my own and reflect my independent and expert judgment.

3. I have been informed that terms in the '152 patent claims should be construed from the vantage point of one skilled in the relevant art reviewing the patent and its file history. In this case, I believe a person of ordinary skill would be someone with a Bachelor of Science degree in a field such as electrical engineering or physics, with 2-5 years of industry experience.

One skilled in the art could also be a person having a Master of Science or Ph.D. degree in a field such as electrical engineering or physics, with 0-2 years of industry experience.

4. My consulting fee for this matter is $445 per hour. It is not contingent on any findings herein, and I will be paid for my services regardless of the outcome herein.

5. I am presently the Chief Technology Officer and Vice President and Director of Engineering at Scram Technologies Inc. / Combat Displays, Inc., and have more than twenty-five years of work experience in the visual imaging and display industry.

6. I received a Bachelor of Science Degree with a major in Physics from Clarkson University in Potsdam, New York, in 1966. I received a Master of Science Degree in physics from the University of Massachusetts in Amherst, Massachusetts, in 1970. I also received a Ph.D. in Electrical Engineering from the University of Massachusetts in 1980. My thesis was entitled *Heterodyne Detectors for 10 Micron Astronomy Applications*.

7. Following completion of my Ph.D., I worked for various companies, including Honeywell, General Electric, McDonnell Douglas, Bose and Polaroid, designing and developing systems for displaying images. During this time, I became familiar with various display technologies such as liquid crystal on silicon (LCOS) and digital micromirror devices (DMD).

8. A copy of my *curriculum vitae* is attached hereto as Appendix A.

9. I have reviewed the '152 patent as well as its prosecution history. I understand that the '152 patent is directed to methods of producing color images that involve projecting light onto a rotating color wheel that has at least four non-white and non-black color filters, and spatially modulating the light of at least four colors in accordance with a data signal to produce the color image. Claim 8 of the patent is directed to converting three-color data into image data representing the color image in terms of at least four different colors.

10. I address the technology relevant to the '152 patent claims in a tutorial that I included on a DVD that has been submitted to the Court. In the tutorial, I focus on how color images are generated and displayed on micro-device type projection TVs.

II. CLAIM TERMS TO BE CONSTRUED

A. "color image"

11. No special technical expertise is required to understand what a "color image" is. Laypersons and skilled artisans would readily understand that any image of color, be it a red image, a blue image, or a red and blue image, is a "color image."

12. Neither the '152 patent nor its prosecution history define the term "color image" at all, or give me a reason to think that the inventors meant anything other than the ordinary meaning of "color image" when using that term.

13. I have reviewed the Preliminary Witness Evaluation of Patent Validity Issues and Declaration of Genoa Color Technologies, Ltd.'s expert, Louis D. Silverstein, Ph.D., and I find no credible basis in either of these documents to support Genoa's definition of "color image."

14. Defendants' proposed definition of "color image" is consistent with what a skilled artisan would understand the term to mean after reading the patent's claims, specification, and prosecution history.

B. "data signal"

15. No special technical expertise is required to understand what a "data signal" is. Laypersons and skilled artisans would readily understand that any signal carrying data is a "data signal." A "data signal" does not need to have a particular number of components, such as the three components suggested by Genoa.

16. Neither the '152 patent nor its prosecution history define the term "data signal" at all, or give me a reason to think that the inventors meant anything other than the ordinary meaning of "data signal" when using that term.

17. I have reviewed the Preliminary Witness Evaluation of Patent Validity Issues and Declaration of Genoa's expert, Louis D. Silverstein, Ph.D., and I find no credible basis in either of these documents to support Genoa's definition of "data signal."

18. Defendants' proposed definition of "data signal" is consistent with what a skilled artisan would understand the term to mean after reading the patent's claims, specification, and prosecution history.

C. "converting"

19. At the time of the alleged invention, there were many known methods of converting a red, green, and blue input signal into an output signal consisting of four or more colors for display, such as the methods described in Takeyuki Ajito et al., *Expanded Color Gamut Reproduced by Six-Primary Projection Display*, Projection Displays 2000: Sixth in a Series, SPIE—The International Society for Optical Engineering; and Masahiro Yamaguchi, *Multiprimary Color Display Using Holographic Optical Element*, published in 1998.

20. As Genoa's expert, Louis D. Silverstein, Ph.D., acknowledges on page 14 of his Preliminary Witness Evaluation of Patent Validity Issues, by the time of Genoa's alleged invention, "the necessity of color mapping from 'standard' inputs consisting of color image data for three primary colors (e.g., RGB) or triplets of processed color signals (e.g., YCC, YUV, YC_bC_r, or XYZ) to a system of more than three primaries is obvious for a multi-primary color display system." I agree.

21. Dr. Silverstein indicates, on page 33 of his Declaration, that the "focus" of the alleged invention of the '152 patent is on "the *integration and co-optimization* of field-sequential, multi-primary color display technology with an *efficient methodology* for multi-primary color mapping and color system management." On page 37 and figure 7 of Dr. Silverstein's Declaration, Dr. Silverstein identifies the manner of "integration and co-optimization" at issue as one that utilizes the approach of partitioning the color gamut into non-overlapping triangles, as shown in Figure 6A of the '152 patent. There was nothing new about this technique for converting at the time of the alleged invention.

22. The '152 patent does not disclose all methods of converting, or "transforming," but rather only this one technique involving partitioning of the color gamut. The '152 patent states that the conversion method "requires the definition of a set of triangles," meaning that one must partition the color gamut into a set of triangles in order to convert a three-primary input signal into an output signal of four or more colors. '152 patent, col. 16, l. 65 - col. 17, l. 2. Thus, the conversion process disclosed in the '152 patent utilizes and requires a partitioned color gamut to convert three-color data to image data representing an image in terms of four or more colors.

23. Numerous statements in the '152 patent make clear that the only method of conversion disclosed in the '152 patent is the use of triangles to partition the color gamut. Those statements include the following:

'152 Patent	**Disclosure on Converting Using a Partitioned Color Gamut**
col. 5, ll. 6-10	"The middle point or points define triangles with adjacent pairs of primaries. The source data is mapped to one of the triangles, and a solution is found for the constant levels for the relevant pair of primaries and the relevant middle point."
col. 14, ll. 29-30	"This arrangement creates six triangles in the color gamut of the display."
col. 14, ll. 56-60	"the three colors at the triangle corners (namely, the white and two out of the six other colors which are at the corners of the relevant triangle, in this example p_1 and p_2) are used to create the additive linear combination representing the input data"
col. 15, ll. 18-20	"The parameters a_1 and a_2 represent constants for the two non-white primaries defining the outside leg of the relevant triangle."
col. 15, ll. 27-29	"To determine the constants a_3, a_4, a_5, and a_6, which determine the levels of the four primaries not part of the relevant triangle"
col. 15, ll. 35-36	"the two non-white primaries forming the relevant triangle also contribute to the white source"
col. 15, ll. 63 - col. 16, l. 6	"the relevant triangle, defined by the white source (x_w, y_w) and two non-white primaries is found, as described above. Next, a second source w_β from w_1 - w_6 is referred to, the relevant source being that formed from the six non-white primaries, with the exclusion of the two non-white primaries firming the outside leg of the relevant triangle. Preferably, the second source w_β and the two non-white primaries forming the outside leg of the relevant triangle form a second triangle which substantially overlaps the relevant triangle."
col. 16, ll. 29-31	"The parameters a_1 and a_2 represent constants

	for the two non-white primaries defining the outside leg of the relevant triangle."
col. 16, ll. 42-44	"the two non-white primaries forming the relevant triangle do not contribute to the relevant source"
col. 16, ll. 65-66 and Figures 3B, 6A-7	"The procedure only *requires* the definition of a set of triangles"

24. Genoa's proposed definition for "converting," and its additional proposed definitions for the remainder of claim 8 of the '152 patent, depart from the disclosure of the '152 patent and the claim language. Genoa's proposed definitions seek to encompass numerous methods of converting, improperly add numerous extraneous terms, and go beyond the scope of what is discussed in the '152 patent, which is converting by partitioning the color gamut to transform three-color data into image data representing an image in terms of four or more colors.

25. I have reviewed the Preliminary Witness Evaluation of Patent Validity Issues and Declaration of Genoa's expert, Dr. Silverstein, and I find no credible basis in either of these documents to support Genoa's definition of "converting" or Genoa's definitions for the remainder of claim 8 of the '152 patent.

26. The Samsung Defendants' proposed definition of "converting" is consistent with what a skilled artisan would understand the term to mean after reading the patent's claims, specification, and prosecution history.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed this 23rd day of May, 2008, in Westborough, Massachusetts.

James F. Shanley

James F. Shanley, Ph.D.